

MECHANICAL ENGINEERING PROGRAM

ABET COURSE SYLLABUS

ME 319/319L: Introduction to Programming for Mechanical Engineers (2 credit)

Course Description (2008-2010 Catalog):

Introduction to computer languages and computer hardware, MATLAB programming environment, Number Systems, MATLAB data types, MATLAB graphics, Functions, Inputs / Outputs, Char variable type, and text processing function library, Plotting functions, Reading a writing data files, Case Studies using different Matlab Toolboxes.

Prerequisite Course: ME100, ME100L, Math 283

Prerequisite (Corequisite) by Topic:

- Introduction to Mechanical Engineering
- Calculus III

Textbook:

MATLAB, AN INTRODUCTION WITH APPLICATIONS, Amos Gilat, WILEY, 3rd Edition. ISBN 978-0-470-10877-2

Other Reference Material: N/A

Course Coordinator: Woosoon Yim, Professor

Course learning outcomes:

1. Perform mathematical operations using arrays and matrices in MATLAB.
2. Create script and user defined function files.
3. Handle data using MATLAB by importing/exporting them from/to different formats (.mat, .doc, .xls).
4. Generate two dimensional plots and perform the essential plotting commands.
5. Write programming codes with conditional statements and loops to solve most engineering problems.
6. Build and simulate basic SIMULINK models.

Relationship of Course to Mechanical Engineering Program Educational Outcomes:

Goal 1: Provide mechanical engineering graduates with technical capabilities.					Goal 2: Prepare the mechanical engineering graduates to have effective workplace skills.				Goal 3: Instilling a sense of responsibility as a professional member of society.			
1.a	1.b	1.c	1.d	1.e	2.a	2.b	2.c	2.d	3.a	3.b	3.c	3.d
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(L)ow					(M)edium (H)igh							

Topics Covered:

1. Space description and homogeneous transformation.
2. Robotic Fundamentals
 - Kinematics (DH notations)
 - Manipulator Jacobian
 - Forces, Moments dynamics
 - Feedback control Techniques
3. Applications and Advanced Topics
 - Robot compliance
 - Operational space
 - Force control

Laboratory Projects: None

Assessment of Student Progress toward Course Objectives

Two mid-term exams, Semester Project, final exam

Class/Laboratory Schedule: 75 minutes lecture two sessions per week (Bi-annual)

Contribution of Course for meeting Professional Component:

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|--|-----------|
| (a) Mathematics and basic sciences: | 0 credit |
| (b) Engineering Topics (Design/Science): | 3 credit |
| (c) General Education: | 0 credit |
| (d) Others: | 0 credits |

Person who prepared this description:

Woosoon Yim, Professor

October 12, 2009